The first order "freezing" transition and the glass transition in a suspension of hard spheres : Are these transitions connected?(New Frontiers in Colloidal Physics : A Bridge between Micro- and Macroscopic Concepts in Soft Matter)

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The mean-squared displacement and the velocity autocorrelation function (VAF) are obtained by dynamic light scattering on suspensions of particles with hard-sphere interactions. The VAF decays to zero from below and follows a stretched exponential function of delay time for the thermodynamically stable suspension. For the metastable suspension a power law emerges. This is a feature indicative of particles trapped in clusters. It is proposed that rearrangements within these clusters leads to crystallization but, should this be frustrated, then their percolation leads to vitrification.